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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/281,097	03/29/1999	SEIICHI IZUMI	450117-4642	6767

20999 7590 04/12/2002

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EXAMINER
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APPIAH, CHARLES NANA

ART UNIT	PAPER NUMBER
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2682

DATE MAILED: 04/12/2002

6

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/281,097

Applicant(s)

IZUMI, SEIICHI

Examiner

Charles Appiah

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 March 1999.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to because appropriate legends and labels should be placed on the blocks in figure 5 to provide a complete illustration of the invention as claimed. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Specification*

2. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

The abstract of the disclosure is objected to because the reference to specific time slots; means and frames does not clearly convey a concise statement of the entire technical disclosure of the invention.

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The title on line 7, and the reference to "figure 1" on line 20, should be deleted. Correction is required. See MPEP § 608.01(b).

### Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.
- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

### *Claim Objections*

3. Claim 5 is objected to because of the following informalities: It appears the word "said predetermined" should be inserted between "of" and "time" on line 3 of claim 5 in order to provide consistency in the claim. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 8-14 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 8 is a single means claim and it is not clear and adequately disclosed how the single means for allocating time slots in a time division duplex communication system could carry out all the claimed functions recited in the claim.

3. Claims 6 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 6, the phrase "in case" renders the claim indefinite because it is unclear what happens when the "additional time slot of a preceding fixed block and an additional time slot of a succeeding fixed block are not adjacent each other".

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Gilbert et al. (6,016,311)**.

With respect to claim 1, Gilbert discloses as illustrated in Figure 2, a method for allocating time slots in a time division duplex communication system, in which information is transmitted in predetermined time frames having a predetermined number of time slots, whereby each time frame comprises a fixed block of one receiving time slot and one transmitting time slot being adjacent to each other (uplink transmission occurring during a first time slot,  $T_a$  while a downlink transmission occurs during a second time slot  $T_b$ , col. 7, lines 32-35). As can be seen from Figure 2, Gilbert teaches that contiguous and consecutive downlink (or alternatively, uplink) transmissions are allowed as part of a dynamic time division duplexing (ATDD) method, such as, an additional time slot  $T_c$ , adjacent to the downlink time slot is allocated as additional receiving time slot (see col. 7, lines 35-40). Gilbert discloses that the ATDD allows time slots to be flexibly and adaptively used for either an uplink or a downlink transmissions based on the bandwidth needs of a particular link thus suggesting the allocating of additional receiving time slot and an additional transmitting dependent on the amount of information that need to be transferred (see col. 7, lines 14-62). As illustrated in figures 3a and 3b, time slots in a frame can be dynamically configured for allocation, either for uplink and downlink transmissions depending on the bandwidth requirements of the channel and that virtually any ratio of uplink and downlink allocations can be established (see col. 8, line 38 to col. 9, line 22). Gilbert fails to specifically teach allocating at least

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the time slot adjacent the transmitting time slot as additional time slot. However, since Gilbert discloses that, a frame can be dynamically configured in any ratio of uplink to downlink allocations using ATDD, it would have been obvious to one of ordinary skill in the art to use Gilbert's system for the allocation of the transmitting and receiving time slots in any desired ratio such as allocating at least the time slot adjacent to the receiving time slot as additional receiving time slot and at least the time slot adjacent the transmitting time slot as additional transmitting time slot for the benefit of flexibly, efficiently and dynamically providing for the changing bandwidth needs of the communication links for communication services such as wideband and broadband services.

With respect to claim 2, Gilbert's teaching of dynamically allocating the uplink and downlink slots in any ratio based on the bandwidth requirements of the channel (see col. 8, line 38 to col. 9, line 22), reads on the number of additional receiving time slots and the number of additional transmitting time slots being independent from each other.

With respect to claim 3, Gilbert further discloses that the one receiving and one transmitting time slot of the fixed block allocated to a first communication unit, whereby the transmitting time slot is preceding the receiving time slot (see col. 6, lines 49-57).

With respect to claim 4, Gilbert further discloses that the uplink and downlink bandwidth requirements of a selected link in a wireless communication system vary due to the types of services and users of the selected link, and that the time slot uplink/downlink ratio is adapted to meet the uplink/downlink bandwidth requirements for

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a given service and for a given user type (see col. 7, lines 4-13), but fails to specifically disclose that the additional slots are allocated to the first communication unit.

However, since Gilbert teaches the dynamic and flexible allocation of the transmitting and receiving time slots in any desired ratio to meet the bandwidth requirements of the type of service and users, it would have been obvious to one of ordinary skill in the art to provide for the allocation of additional time slots to a desiring user such as the first communication unit in order to meet the needs of the user based on a given service and user type.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Gilbert et al** as applied to claim 4 above, and further in view of **Shepherd et al. (5,117,423)**.

With respect to claim 5, Gilbert as modified meets all limitations as applied to claim 4 above.

Gilbert as modified fails to teach that one of the predetermined time frames is assigned to several communication units and the additional time slots are allocated to communication units different from the first communication unit.

The concept of allocating the time slots in a predetermined time frame to carry out multiple communication links is very well known in wireless communication systems as taught for example by Shepherd. Shepherd teaches for data transmission over a TDD communication system in which a time frame structure as illustrated in Figure 2, is composed of time slots which are paired and used in setting up a call between a primary station (base station) and a secondary station (portable handheld units), see col. 1, lines 10-57). According to Shepherd in response to a determination that a data



transmission will be asymmetrical, then the time slot not being used for the transmission of useful data is released and made available for other unidirectional signaling (see col. 2, line 55 to col. 3, line 15)

It would therefore have been obvious to combine the above teaching of Shepherd by providing for the assignment of the time slots of a frame to different communication units with the system of for the benefit of accounting for the needs of different channel links in the dynamic and flexible allocation of time slots with improved channel coherency.

7. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Gilbert et al** as applied to claim 1 above, and further in view of **Fujiwara (4,513,416)**.

With respect to claim 6, Gilbert fails to teach that in case (as best understood by examiner), an additional time slot of a preceding fixed block and an additional time slot of a succeeding fixed block are adjacent to each other, a guard period is provided in at least one of the adjacent additional time slots.

Fujiwara teaches a system in a TDMA network in which the time slots in a frame are arranged with a guard time between two adjacent time slots (see Fig. 2, col. 4, lines 51-65).

It would therefore have been obvious to one of ordinary skill in the art to combine the above teaching of Fujiwara with Gilbert for the benefit of ensuring slot timing is controlled on an as needed basis.

Regarding claim 7, Gilbert teaches, as illustrated in Figures 3a and 3b, of configuring a frame to allocate the time slots in an adaptive manner such that any ratio

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of uplink and downlink allocations can be established (see col. 9, lines 2-35). The combination of Gilbert and Fujiwara fail to teach that the additional time slot of the preceding fixed block is a receiving time slot and the additional time slot of the succeeding fixed block is a transmitting time slot whereby the guard period is provided at the end of the receiving time slot.

However, since the combination of Gilbert and Fujiwara teaches allocating the time slots in a dynamic adaptive manner with any desired ratio of receiving and transmitting time slots having a guard period between two adjacent time slots, it would have been obvious to one of ordinary skill in the art to constitute the preceding frame and the succeeding frame in any ratio of the receiving and transmitting time slots such that the guard period would be provided at a desired location such as at the end of the receiving time slot for the benefit of flexibly, efficiently and dynamically providing for the changing bandwidth needs of the communication links for communication services such as wideband and broadband services.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kanerva et al. (6,240,076) discloses an asymmetric high-speed data transmission method in a mobile communications network.

Uola (WO 96/19086) discloses a traffic channel arrangement using two successive time slots in a frame in a mobile telephone system.

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Gaskill (5,629,940) discloses a system for transmitting and receiving long messages.

Petranovich (5,710,762) discloses frame structure for use in mobile communications systems utilizing slotted protocols.

Elliot et al. (5,809,015) discloses a TDMA communication system for maximizing adjacent pairs of slots in a TDMA frame.

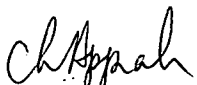
Rorie (GB 2 332 595) discloses a slot allocation in a TDD wireless communication system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Appiah whose telephone number is 703 305-4772. The examiner can normally be reached on M-F 7:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 703 305-6739. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9314 for regular communications and 703 308-6296 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-4750.

Charles Appiah  
April 5, 2002.

  
**CHARLES APPIAH**  
**PATENT EXAMINER**